

AMENDMENTS TO THE CLAIMS**Please amend the claims as follows:**

1. (currently amended) A system for improved simulation of a biological system comprising a plurality of chemical reactions, the system comprising:

a storage; and

a processor configured to:

~~a modeling component for constructing~~ construct a graphical model of a biological system including a first chemical reaction and a second chemical reaction, the graphical model including a specified constraint provided in addition to the first and second chemical reactions that constrains dynamic behavior of the biological system;

~~a storage component for storing the graphical model of the biological system; and~~

~~a simulation engine accepting~~ accept as input said the constructed graphical model of the biological system, ~~and generating~~

generate as output dynamic behavior of the biological system using a first type of computational model for the first chemical reaction, a second type of computational model for the second chemical reaction, and the specified constraint, and

store the dynamic behavior of the biological system in the storage.

2. (currently amended) The system of claim 1 wherein ~~the modeling component allows~~ the processor is further configured to allow construction of a block diagram model of the biological system.

3. (currently amended) The system of claim 2 wherein ~~the modeling component further includes~~ the processor is further configured to provide at least one block identifying a set of related chemical reactions.

4. (currently amended) The system of claim 1 wherein ~~the modeling component includes the processor is further configured to provide~~ a graphical user interface for accepting user commands and data.

5. (currently amended) The system of claim 1 wherein ~~said the~~ first type of computational model is selected from the group consisting of ordinary differential equation analysis, partial differential equation analysis, difference equation analysis, algebraic equation analysis, and stochastic analysis.

6. (currently amended) The system of claim 5 wherein ~~said the~~ second type of computational model is selected from the group consisting of ordinary differential equation analysis, partial differential equation analysis, difference equation analysis, algebraic equation analysis, and stochastic analysis.

7. (currently amended) The system of claim 1 wherein ~~said the~~ second type of computational model is selected from the group consisting of ordinary differential equation analysis, partial differential equation analysis, difference equation analysis, algebraic equation analysis, and stochastic analysis.

8. (currently amended) The system of claim 1, ~~wherein the processor is further configured to comprising an analysis environment in communication with said simulation engine, said analysis environment displaying display~~ the dynamic behavior of the biological system.

9. (currently amended) An improved method for simulation of a biological system including a first chemical reaction and a second chemical reaction, the method comprising ~~the steps of:~~

(a) constructing a graphical model of the biological system including ~~a the~~ first chemical reaction and ~~a the~~ second chemical reaction, the graphical model including a specified constraint provided in addition to the first and second chemical reactions that constrains dynamic behavior of the biological system;

(b) ~~storing the graphical model of the biological system; and~~

~~(e)~~ generating dynamic behavior of the modeled biological system using a first type of computational model for the first chemical reaction, a second type of computational model for the second chemical reaction and the specified constraint; and

~~storing the dynamic behavior of the modeled biological system in a storage.~~

10. (currently amended) The method of claim 9 wherein ~~step (a) constructing further comprises:~~

~~constructing a block diagram model of the biological system.~~

11. (original) The method of claim 10 wherein the block diagram model includes at least one block identifying a set of related chemical reactions.

12. (currently amended) The method of claim 9 wherein ~~step (a) constructing further comprises:~~

~~(i) providing a graphical user interface for accepting user commands and data; and~~

~~(ii) constructing a the graphical model of the biological system including a first chemical reaction and a second chemical reaction using the user commands and data.~~

13. (currently amended) The method of claim 9 wherein ~~step (e) generating further comprises:~~

~~(i) generating an expected result of the first chemical reaction using a computational model selected from the group consisting of ordinary differential equation analysis, partial differential equation analysis, difference equation analysis, algebraic equation analysis, and stochastic analysis; and~~

~~(ii) generating an expected result of the second chemical reaction.~~

14. (currently amended) The method of claim 9 wherein ~~step (e) generating further comprises:~~

~~(i) generating an expected result of the first chemical reaction; and~~

~~(ii) generating an expected result of the second chemical reaction using a computational model selected from the group consisting of ordinary differential equation analysis, partial differential equation analysis, difference equation analysis, algebraic equation analysis, and stochastic analysis.~~

15. (previously presented) The method of claim 9 further comprising displaying an expected result of the first chemical reaction or the second chemical reaction.

16. (currently amended) An article of manufacture having embodied thereon computer-readable ~~program means instructions~~ for improved simulation of a biological system comprising a plurality of chemical reactions, the article of manufacture comprising:

computer-readable ~~program means instructions~~ for constructing, using ~~the~~ received user commands and data, a graphical model of a biological system including a first chemical reaction and a second chemical reaction, the graphical model including a specified constraint provided in addition to the ~~first and second~~ chemical reactions that constrains dynamic behavior of the biological system;

~~computer-readable program means for storing the graphical model of the biological system; and~~

computer-readable ~~program means instructions~~ for generating, using the constructed graphical model of the biological system, dynamic behavior of the modeled biological system using a first type of computational model for the first chemical reaction, a second type of computational model for the second chemical reaction, and the specified constraint; ~~and~~

~~computer-readable instructions for storing the dynamic behavior of the modeled biological system in a storage.~~

17. (currently amended) The article of manufacture of claim 16 further comprising computer-readable ~~program means instructions~~ for displaying the dynamic behavior that is generated.

18. (currently amended) The article of manufacture of claim 16 wherein ~~said the~~ computer-readable ~~program means instructions~~ for constructing a graphical model of the biological system comprises computer-readable ~~program means instructions~~ for constructing a block diagram model of the biological system.

19. (currently amended) The article of manufacture of claim 16 wherein ~~said the~~ computer-readable ~~program means instructions~~ for constructing a block diagram model of the biological

system includes computer-readable ~~program-means-instructions~~ for constructing at least one block identifying a set of related chemical reactions.

20. (currently amended) The article of manufacture of claim 16 wherein computer-readable ~~program-means-instructions~~ for generating dynamic behavior of the modeled biological system comprises computer-readable ~~program-means-instructions~~ for generating an expected result of the first chemical reaction using a computational model selected from the group consisting of ordinary differential equation analysis, partial differential equation analysis, difference equation analysis, algebraic equation analysis, and stochastic analysis.

21. (currently amended) The article of manufacture of claim 16 wherein computer-readable ~~program-means-instructions~~ for generating dynamic behavior of the modeled biological system comprises computer-readable ~~program-means-instructions~~ for generating an expected result of the second chemical reaction using a computational model selected from the group consisting of ordinary differential equation analysis, partial differential equation analysis, difference equation analysis, algebraic equation analysis, and stochastic analysis.

22. (currently amended) The article of manufacture of claim 16 further ~~comprises-comprising~~ computer-readable ~~program-means-instructions~~ for displaying an expected result of the first chemical reaction or the second chemical reaction.

23-44. (canceled)

45. (currently amended) A ~~computer-implemented-method-system~~ for simulation of a biological system including a first chemical reaction and a second chemical reaction, the ~~method-system~~ comprising:

means for constructing a graphical model of the biological system including a first chemical reaction and a second chemical reaction, the graphical model including a specified constraint provided in addition to the first and second chemical reactions that constrains dynamic behavior of the biological system;

~~annotating the graphical model in response to a user requesting to add annotations to the model that are provided by the user;~~

~~storing the graphical model of the biological system; and~~

~~means for~~ generating dynamic behavior of the modeled biological system using a first type of computational model for the first chemical reaction, ~~and a second type of computational model for the second chemical reaction, and the specified constraint; and~~

~~means for storing the dynamic behavior of the modeled biological system in a storage.~~

46. (currently amended) A computer-readable storage medium holding computer-executable instructions for simulation of a biological system, the medium comprising one or more instructions for:

~~instructions for constructing a graphical model of the biological system including a first chemical reaction and a second chemical reaction in the biological system;~~

~~instructions for storing the graphical model of the biological system;~~

~~instructions for determining calculating~~ putative reaction times for execution of the first chemical reaction and the second chemical reaction in the graphical model;

~~instructions for sorting the putative reaction times;~~

~~instructions for executing one of the first~~ chemical reaction and ~~the second~~ chemical reaction identified by a first reaction, the first chemical reaction being executed using a first type of computational model ~~and concurrently with~~ the second chemical reaction being executed using a second type of computational model;

~~instructions for recalculating the putative reaction times for the first~~ chemical reaction and the second chemical reaction after ~~the executing of the one of the first type of computation model or reaction and the second type of computational model~~ reaction identified by the first reaction; and

~~instructions for resortingsorting the recalculated~~ putative reaction times; and

~~storing the recalculated and sorted putative reaction times in a storage.~~

47. (currently amended) The medium of claim 46, further comprising:

instructions for iterating execution of the ~~instructions for executing, the instructions for recalculating and resorting the instructions for sorting the recalculated putative reaction times~~ instructions until a final simulation time has been reached to generate a dynamic behavior of the modeled biological system.

Please add claim 48 as follows:

48. (new) The method of claim 9, further comprising:

annotating the graphical model in response to a user requesting to add annotations to the model that are provided by the user.